

Amendment to Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (original) A method for compressing image data
- 2 corresponding to an image comprising a plurality of pixels defining a grid,
- 3 each pixel having at least one component value, comprising:
- 4 dividing the grid into at least one rectangular area;
- 5 for each rectangular area:
- 6 dividing the rectangular area into a number of triangles, each
- 7 triangle defining a boundary comprising three edges;
- 8 for each of triangle:
- 9 identifying the vertices of the triangle;
- 10 determining predicted pixel component values for at
- 11 least a portion of the pixels enclosed within and/or on the
- 12 boundary of the triangle;
- 13 comparing the predicted pixel component values with
- 14 actual values of said at least one component value to
- 15 determine if a similarity threshold is met;
- 16 processing a next triangle if the similarity threshold is
- 17 met, otherwise,
- 18 dividing the triangle into two new triangles, each
- 19 defining a boundary and comprising three edges; and
- 20 reiteratively repeating identifying the vertices, predicting pixel
- 21 component values, and comparing actual and predicted pixel component
- 22 values to determine if a similarity threshold is met for each existing
- 23 triangle and any new triangles that are created; and
- 24 generating compressed image data defining each triangle
- 25 that is created and actual and predicted pixel component values
- 26 within the triangle.

1 2. (original) The method of claim 1, wherein the
2 compressed image data comprises at least one string, the method further
3 comprising compressing said at least one string using a data compression
4 algorithm.

1 3. (original) The method of claim 1, wherein at least a
2 portion of the triangles are defined by data identifying pixels coincident
3 with or proximate to a set of vertices for the triangle, and the predicted
4 pixel component values for those triangles are determined by interpolating
5 actual pixel component values at the vertices of each triangle.

1 4. (original) The method of claim 1, wherein the predicted
2 pixel component values are determined by interpolating actual component
3 values corresponding to pixels that lie on and/or proximate to the edges of
4 each triangle.

1 5. (original) The method of claim 1, wherein the image is a
2 grayscale image, and said at least one component value comprises a
3 grayscale intensity level.

1 6. (original) The method of claim 1, wherein the image
2 comprises a color image, and said at least one component value
3 comprises three color component values.

1 7. (original) The method of claim 6, wherein the three color
2 component values comprise a Red component value, a Green component
3 value, and a Blue component value, further comprising converting the
4 Red, Green, and Blue component values into luminance/chrominance
5 component values.

1 8. (original) The method of claim 7, wherein said
2 comparing of the predicted pixel component values to determine if the
3 similarity threshold is met comprises giving a similarity determination that
4 compares predicted and actual luminance component values greater
5 weight than a similarity determination that considers predicted and actual
6 chrominance component values.

1 9. (original) The method of claim 1, further comprising:
2 determining if a texture map can be applied to pixels of a given
3 triangle to meet the similarity threshold; and
4 storing data identifying the pixels within and/or on the triangle
5 boundary and data corresponding to the texture map for any triangle for
6 which it is determined that texture mapping can be applied.

1 10. (original) The method of claim 1, wherein each of said at
2 least one rectangle comprises a square.

1 11. (original) The method of claim 10, wherein the image
2 comprises a plurality of pixels contained within a rectangular grid, and
3 wherein the rectangular grid is divided into a number of non-overlapping
4 squares that contain all of the pixels within the rectangular grid.

1 12. (original) The method of claim 1, wherein at least one
2 triangle comprises a right angle corner and a hypotenuse, and where
3 dividing said at least one triangle into two triangles comprises dividing said
4 at least one triangle along a line connecting a midpoint of the hypotenuse
5 to the right angle corner.

1 13. (Currently amended) A method for reproducing an
2 image based on a set of compressed image data corresponding to an
3 original image comprising a plurality of pixels defining a grid, said

4 compressed image data including data defining a plurality of triangles and
5 pixel component values corresponding to each of said plurality of
6 triangles, comprising:

7 extracting a first set of vertices for each of said plurality a first of the
8 triangles;

9 determining first component values of pixels within each the first
10 triangle;

11 rendering each the first triangle in accord with the first set of
12 vertices and first component values determined for the first that triangle;

13 extracting a second set of vertices for a second of the triangles, the
14 second triangle being nested within the first triangle;

15 determining second component values of pixels within the second
16 triangle;

17 rendering the second triangle in accord with the second set of
18 vertices and second component values determined for the second
19 triangle;

1 14. (Currently Amended) The method of claim 13, wherein
2 the compressed image data includes pixel component values for pixels
3 coincident with or proximate to each vertex, and at least either the pixel
4 first component values corresponding to other pixels within each triangle
5 are determined as a function of the pixel component values at the first
6 vertices of the first triangle, or the second component values are
7 determined as a function of component values at the second vertices of
8 the second triangle.

1 15. (Currently Amended) The method of claim 14, wherein
2 at least either the first pixel component values corresponding to the other
3 pixels within each triangle are determined by interpolating the pixel
4 component values at the first vertices of the first triangle, or the second

5 component values are determined by interpolating component values at
6 the second vertices of the second triangle.

1 16. (Currently Amended) The method of claim 13, wherein
2 ~~at least either the compressed image data includes data pertaining to sets~~
3 ~~of pixels defining edges of at least a portion of said plurality of triangles~~
4 ~~and including pixel component values for those pixels, further wherein the~~
5 ~~first pixel component values for the triangles are determined as a function~~
6 ~~of the pixel component values corresponding to the pixels defining the first~~
7 ~~edges of the first triangles, or the second component values are~~
8 ~~determined as a function of component values corresponding to pixels~~
9 ~~defining second edges of the second triangle.~~

1 17. (Currently Amended) The method of claim 13, wherein
2 ~~the compressed image data includes texture mapping data, further~~
3 ~~including:~~
4 ~~determining any triangles from among said plurality of triangles to~~
5 ~~which texture mapping is to be applied; and~~
6 ~~applying texture mapping to the pixels contained within those the~~
7 ~~second triangles.~~

1 18. (Currently Amended) The method of claim 13, wherein
2 ~~the compressed image data corresponds to a color image and includes~~
3 ~~pixel said determining of first and second component values data in~~
4 ~~accordance with a luminance/chrominance color model, further~~
5 ~~comprising include converting the respective first and second~~
6 ~~luminance/chrominance color model data to first and second red, green~~
7 ~~and blue (RGB) color components for each the pixels of the first and~~
8 ~~second triangles.~~

1 19. (Cancelled) ~~The method of claim 13, further comprising~~
2 ~~rendering said plurality of triangles such that enclosing larger triangles are~~
3 ~~rendered prior to enclosed smaller triangles.~~

1 20. (original) A system for compressing image data
2 corresponding to an image comprising a plurality of pixels defining a grid,
3 each pixel having at least one component value, comprising:
4 a memory in which machine instructions are stored; and
5 a processor coupled to the memory for executing the
6 machine instructions, said processor implementing a plurality of functions
7 when executing the machine instructions, including:
8 dividing the grid into at least one rectangular area;
9 for each rectangular area:
10 dividing the rectangular area into a number of triangles, each
11 triangle defining a boundary comprising three edges;
12 for each of triangle:
13 identifying the vertices of the triangle;
14 determining predicted pixel component values for at
15 least a portion of the pixels enclosed within and/or on the
16 boundary of the triangle;
17 comparing the predicted pixel component values with
18 actual values of said at least one component value to
19 determine if a similarity threshold is met;
20 processing a next triangle if the similarity threshold is
21 met, otherwise,
22 dividing the triangle into two new triangles, each
23 defining a boundary and comprising three edges; and
24 reiteratively repeating identifying the vertices, predicting pixel
25 component values, and comparing actual and predicted pixel component
26 values for each existing triangle and any new triangles that are created;
27 and

28 generating compressed image data defining each triangle that is
29 created and actual and predicted pixel component values within the
30 triangle.

1 21. (original) The system of claim 20, wherein at least a
2 portion of the triangles are defined by data identifying pixels coincident
3 with or proximate to a set of vertices for the triangle, and the predicted
4 pixel component values are determined by interpolating actual pixel
5 component values at the vertices of each triangle.

1 22. (original) The system of claim 20, wherein the predicted
2 pixel component values are determined by interpolating actual component
3 values corresponding to pixels that lie on and/or proximate to the edges of
4 each triangle.

1 23. (original) The system of claim 20, wherein the image
2 comprises a color image, and said at least one component value
3 comprises a Red component value, a Green component value, and a Blue
4 component value, and wherein execution of the machine instructions by
5 the processor further implements the function of converting the Red,
6 Green, and Blue component values into luminance/chrominance
7 component values.

1 24. (original) The system of claim 20, wherein execution of
2 the machine instructions by the processor further implements the
3 functions of:
4 determining if a texture map can be applied to pixels of a given
5 triangle to meet the similarity threshold; and
6 storing data identifying the pixels within and/or on the triangle
7 boundary and data corresponding to the texture map for any triangle for
8 which it is determined that texture mapping can be applied.

1 25. (original) The system of claim 20, wherein the image
2 comprises a plurality of pixels contained within a rectangular grid, and
3 wherein the rectangular grid is divided into a minimum number of non-
4 overlapping squares that contain all of the pixels within the rectangular
5 grid.

1 26. (original) An article of manufacture for compressing
2 image data corresponding to an image comprising a plurality of pixels
3 defining a grid, each pixel having at least one component value,
4 comprising:
5 a memory media adapted to be used with a computer; and
6 a plurality of machine instructions stored on the memory
7 media, said machine instructions effecting a plurality of functions when
8 executed by the computer, including:
9 dividing the grid into at least one rectangular area;
10 for each rectangular area:
11 dividing the rectangular area into a number of triangles, each
12 triangle defining a boundary comprising three edges;
13 for each of triangle:
14 identifying the vertices of the triangle;
15 determining predicted pixel component values for at
16 least a portion of the pixels enclosed within and/or on the
17 boundary of the triangle;
18 comparing the predicted pixel component values with
19 actual values of said at least one component value to
20 determine if a similarity threshold is met;
21 processing a next triangle if the similarity threshold is
22 met, otherwise,
23 dividing the triangle into two new triangles, each
24 defining a boundary and comprising three edges; and

25 reiteratively repeating identifying the vertices, predicting pixel
26 component values, and comparing actual and predicted pixel component
27 values for each existing triangle and any new triangles that are created;
28 and
29 generating compressed image data defining each triangle that is
30 created and actual and predicted pixel component values within the
31 triangle.

1 27. (original) The article of manufacture of claim 26, wherein
2 at least a portion of the triangles are defined by data identifying pixels
3 coincident with or proximate to a set of vertices for the triangle, and the
4 predicted pixel component values are determined by interpolating actual
5 pixel component values at the vertices of each triangle.

1 28. (original) The article of manufacture of claim 26, wherein
2 the predicted pixel component values are determined by interpolating
3 actual component values corresponding to pixels that lie on and/or
4 proximate to the edges of each triangle.

1 29. (original) The article of manufacture of claim 26, wherein
2 the image comprises a color image, and said at least one component
3 value comprises a Red component value, a Green component value, and
4 a Blue component value, and wherein said functions effectuated when
5 executed by the computer further include the function of converting the
6 Red, Green, and Blue component values into luminance/chrominance
7 component values.

1 30. (original) The article of manufacture of claim 26, wherein
2 said functions effectuated when executed by the computer further include
3 the functions of:

4 determining if a texture map can be applied to pixels of a given
5 triangle to meet the similarity threshold; and
6 storing data identifying the pixels within and/or on the triangle
7 boundary and data corresponding to the texture map for any triangle for
8 which it is determined that texture mapping can be applied.

1 31. (original) The article of manufacture of claim 26, wherein
2 the image comprises a plurality of pixels contained within a rectangular
3 grid, and wherein the rectangular grid is divided into a minimum number of
4 non-overlapping squares that contain all of the pixels within the
5 rectangular grid.